

1. (Previously Presented) A method of using a feedback control to non-invasively identify and locate one or more subsurface targets based on predetermined conditions for selective laser treatment at a tissue surface area, comprising the steps of:

a) identifying the location of the one or more subsurface targets in the tissue surface area by:

i) directing one of a polarized and an unpolarized light having a predetermined wavelength at the tissue surface area;

ii) detecting one or more reflections of said light using a multi-dimensional photo-sensor;

iii) measuring one or more characteristics indicative of the physio-chemical properties for each of the one or more subsurface targets by automatically analyzing the reflections detected by said photo-sensor and comparing the analyzed reflections with the predetermined conditions, said predetermined conditions defined at least in part by one of predetermined image analysis and one or more mathematical treatment algorithms relating to features of an image; and

b) treating the one or more subsurface targets identified during the identification step by automatically applying a laser of a predetermined wavelength and a predetermined power to the one or more subsurface targets in accordance with the one or more characteristics; and

c) automatically adjusting one or more parameters of the laser in real time in accordance with the one or more characteristics until treatment is complete.

2. (Previously Presented) The method of claim 1, wherein the one or more characteristics include at least one of a size, a shape, a color, a contrast, a brightness, a pattern, a structure, and a treatment status of tissue at the one or more subsurface targets.

3. (Previously Presented) The method of claim 1, wherein the one or more characteristics include at least one of photometric, spectrometric, and topological properties of tissue at the one or more subsurface targets.

4. (original) The method of claim 1, further comprising the step of pulsing the laser on and off to control laser delivery to the one or more subsurface targets.

5. (canceled)

6. (previously presented) The method of claim 1, wherein the one or more parameters include at least one of a spot size, a pulse width, a wavelength and a power of the laser.

7. (original) The method of claim 6, wherein the spot size is adjusted through actuated movement of one or more optical components.

8. (original) The method of claim 7, wherein the one or more optical components includes one or more focusing lenses.

9. (Previously Presented) The method of claim 1, wherein the identification step provides rapid feedback for tracking rapid relative movement between the laser and the one or more subsurface targets so that laser-targeting error is minimized.

10. (original) The method of claim 9, wherein the rapid feedback has a bandwidth of more than 0.5 Hz.

11. (currently amended) The method of claim 9, further comprising the step of performing real time diagnosis of treatment results and efficacy of the ~~heating step~~ treatment by repeating the identification step after the ~~heating~~ treating step.

12. (Previously Presented) The method of claim 1, wherein the feedback control is one of semi-automatic and fully automatic.

13. (original) The method of claim 1, wherein a spot size of the laser is less than 3 mm.

14. (original) The method of claim 1, wherein the laser is a continuous wave laser.

15. (Previously Presented) The method of claim 1, wherein the target location determined at the identification step for said each subsurface target is determined by inference from a corresponding location.

16. (original) The method of claim 15, wherein said inference is based on the predetermined conditions.

17. (original) The method of claim 1, wherein said feedback control is one of a closed-loop feedback control and a quasi-closed-loop feedback control.

18. (Previously Presented) The method of claim 1, further comprising the step of determining a polarization of the one or more reflections, wherein the location and one or more characteristics for each of the one or more subsurface targets are determined based upon the polarization of the one or more reflections.

19. (previously presented) The method of claim 1, wherein said treating step includes one of heating and modifying the one or more subsurface targets.

20. (canceled)

21. (Currently Amended) The apparatus of claim ~~[[20]]~~ 53, wherein the one or more ~~determined~~ characteristics include at least one of a size, a shape, a color, a contrast, a brightness, a pattern, a structure, and a treatment status of tissue at the one or more subsurface targets.

22. (Currently Amended) The apparatus of claim ~~[[20]]~~53, wherein the one or more ~~determined~~ characteristics include at least one of photometric, spectrometric, and topological properties of tissue at the one or more subsurface targets.

23. (Currently Amended) The apparatus of claim ~~[[20]]~~53, wherein the treating means pulses the laser on and off to control laser delivery to the one or more subsurface targets.

24. (canceled)

25. (Currently Amended) The apparatus of claim ~~[[20]]~~53, wherein the one or more parameters include at least one of a spot size, a pulse width, a wavelength and a power of the laser.

26. (Previously Presented) The apparatus of claim 25, wherein the spot size is adjusted through actuated movement of one or more optical components.

27. (Previously Presented) The apparatus of claim 26, wherein the one or more optical components includes one or more focusing lenses.

28. (Currently Amended) The apparatus of claim ~~[[20]]~~ 53, wherein the directing, detecting, and ~~determining~~ measuring means perform rapid feedback for tracking rapid relative

movement between the laser and the one or more subsurface targets so that laser-targeting error is minimized.

29. (Previously Presented) The apparatus of claim 28, wherein the rapid feedback has a bandwidth of more than 0.5 Hz.

30. (Currently Amended) The apparatus of claim 38, wherein the directing, detecting, and ~~determining~~ measuring means perform real time diagnosis of treatment results and efficacy of the ~~heating means~~ laser.

31. (Currently Amended) The apparatus of claim ~~[[20]]~~53, wherein the feedback control is one of semi-automatic and fully automatic.

32. (Currently Amended) The apparatus of claim ~~[[20]]~~53, wherein a spot size of the laser is less than 3 mm.

33. (Currently Amended) The apparatus of claim ~~[[20]]~~53, wherein the laser is a continuous wave laser.

34. (Currently Amended) The apparatus of claim ~~[[20]]~~53, wherein the ~~determining~~ measuring means determines the location for said each subsurface target by inference from a corresponding location detected by said detecting means.

35. (Previously Presented) The apparatus of claim 34, wherein said inference is based on the predetermined conditions.

36. (Currently Amended) The apparatus of claim [[20]]53, wherein said feedback control is one of a closed-loop and a quasi-closed-loop feedback control.

37. (Currently Amended) The apparatus of claim [[20]]53, further comprising means for determining a polarization of the one or more reflections, wherein the location and one or more characteristics for each of the one or more subsurface targets are determined based upon the determined polarization.

38. (Currently Amended) The apparatus of claim [[20]]53, wherein said treatment performed by the treating means includes one of heating ~~means~~ and modifying ~~means~~ for respectively heating and modifying the one or more subsurface targets.

39. (canceled)

40. (withdrawn) A set of computer program instructions for using feedback control to non-invasively identify and locate one or more subsurface targets based on predetermined conditions for selective laser treatment at a tissue surface area, comprising:

an instruction for detecting one or more reflections of light from the tissue surface area using a multi-dimensional photo-sensor;

an instruction for determining a location and one or more characteristics for each of the one or more subsurface targets based upon the one or more reflections detected by said photo-sensor and said predetermined conditions, said predetermined conditions defined at least in part by one of predetermined image analysis and mathematical algorithms; and

an instruction for selectively treating the one or more subsurface targets using a laser of a predetermined wavelength and a predetermined power in accordance with the determined location and the one or more determined characteristics.

41. (withdrawn) The set of computer program instructions of claim 40, further comprising an instruction for directing one of a polarized and an unpolarized light having a predetermined wavelength at the tissue surface area.

42. (withdrawn) The set of computer program instructions of claim 40, wherein the one or more determined characteristics include at least one of a size, a shape, a color, a contrast, a brightness, a pattern, a structure, and a treatment status of tissue at the one or more subsurface targets.

43. (withdrawn) The set of computer program instructions of claim 40, wherein the one or more determined characteristics include at least one of photometric, spectrometric, and topological properties of tissue at the one or more subsurface targets.



44. (withdrawn) The set of computer program instructions of claim 40, wherein the determined location for said each subsurface target is determined by inference from a corresponding detected location.

45. (withdrawn) The set of computer program instructions of claim 44, wherein said inference is based on the predetermined conditions.

46. (canceled)

47. (canceled)

48. (canceled).

49. (canceled)

50. (canceled).

51 (New) A method of using a feedback control to non-invasively identify and locate one or more subsurface targets based on predetermined conditions for selective laser treatment at a tissue surface area, comprising the steps of:

a) identifying the location of the one or more subsurface targets in the tissue surface area by:

- i) directing one of a polarized and an unpolarized light having a predetermined wavelength at the tissue surface area;
- ii) detecting one or more reflections of said light using a multi-dimensional photo-sensor; and
- iii) measuring one or more characteristics indicative of the physio-chemical properties for each of the one or more subsurface targets by automatically analyzing the reflections detected by said photo-sensor and comparing the analyzed reflections with the predetermined conditions, said predetermined conditions defined at least in part by one of predetermined image analysis and one or more mathematical treatment algorithms relating to features of an image.

52 (New) The method of claim 51, further comprising the steps of:

- b) treating the one or more subsurface targets identified during the identification step by automatically applying a laser of a predetermined wavelength and a predetermined power to the one or more subsurface targets in accordance with the one or more characteristics; and
- c) automatically adjusting one or more parameters of the laser in real time in accordance with the one or more characteristics until treatment is complete.

53 (New) An apparatus adapted and configured to use feedback control to non-invasively identify and locate one or more subsurface targets based on predetermined conditions for selective laser treatment at a tissue surface area, comprising:

- a) means for identifying the location of the one or more subsurface targets in the tissue surface area including:

- i) means for directing one of a polarized and an unpolarized light having a predetermined wavelength at the tissue surface area;
  - ii) means for detecting one or more reflections of said light including a multi-dimensional photo-sensor; and
  - iii) means for measuring one or more characteristics indicative of the physio-chemical properties for each of the one or more subsurface targets, wherein the measuring means is adapted and configured to automatically analyze the reflections detected by said photo-sensor and compare the analyzed reflections with the predetermined conditions, said predetermined conditions defined at least in part by one of predetermined image analysis and one or more mathematical treatment algorithms relating to features of an image;
- b) means for treating the one or more subsurface targets identified by the identifying means including a laser, wherein the treating means is adapted and configured to automatically apply the laser at a predetermined wavelength and a predetermined power to the one or more subsurface targets in accordance with the one or more characteristics; and
- c) means for automatically adjusting one or more parameters of the laser in real time in accordance with the one or more characteristics until treatment is complete.

54. (New) An apparatus adapted and configured to use feedback control to non-invasively identify and locate one or more subsurface targets based on predetermined conditions for selective laser treatment at a tissue surface area, comprising:

- a) a detector for identifying the location of the one or more subsurface targets in the tissue surface area, the detector including:

- i) an optical pathway operably coupled to a light source adapted and configured to direct one of a polarized and an unpolarized light having a predetermined wavelength at the tissue surface area;
  - ii) a multi-dimensional photo-sensor adapted and configured to detect one or more reflections of said light; and
  - iii) a processor for evaluating one or more characteristics indicative of the physio-chemical properties for each of the one or more subsurface targets, wherein the processor is adapted and configured to automatically analyze the reflections detected by the photo-sensor and compare the analyzed reflections with the predetermined conditions, the predetermined conditions defined at least in part by one of predetermined image analysis and one or more mathematical treatment algorithms relating to features of an image;
- b) a laser for treating the one or more subsurface targets identified by the detector, wherein the laser is adapted and configured to automatically apply light at a predetermined wavelength and a predetermined power to the one or more subsurface targets in accordance with the one or more characteristics; and
- c) wherein the processor is adapted and configured to automatically adjust one or more parameters of the laser in real time in accordance with the one or more characteristics by moving at least one optical components in a path defined by the laser until treatment is complete.

55. (New) An apparatus adapted and configured to use feedback control to non-invasively identify and locate one or more subsurface targets based on predetermined conditions for selective laser treatment at a tissue surface area, comprising:

a) a detector for identifying the location of the one or more subsurface targets in the tissue surface area, the detector including:

- i) an optical pathway operably coupled to a light source adapted and configured to direct one of a polarized and an unpolarized light having a predetermined wavelength at the tissue surface area;
- ii) a multi-dimensional photo-sensor adapted and configured to detect one or more reflections of said light; and
- iii) a processor for evaluating one or more characteristics indicative of the physio-chemical properties for each of the one or more subsurface targets, wherein the processor is adapted and configured to automatically analyze the reflections detected by the photo-sensor and compare the analyzed reflections with the predetermined conditions, the predetermined conditions defined at least in part by one of predetermined image analysis and one or more mathematical treatment algorithms relating to features of an image;

56. (New) The apparatus of Claim 55, further including:

- b) a laser for treating the one or more subsurface targets identified by the detector, wherein the laser is adapted and configured to automatically apply light at a predetermined wavelength and a predetermined power to the one or more subsurface targets in accordance with the one or more characteristics; and
- c) wherein the processor is adapted and configured to automatically adjust one or more parameters of the laser in real time in accordance with the one or more characteristics by moving at least one optical components in a path defined by the laser until treatment is complete.